PAGASYS® Remote Amplifier and Controller
Models: GENII-RC and GENII-RA700

Description, Installation, and User Manual
Limited Warranty

This product is subject to and covered by a limited warranty, a copy of which can be found at www.fedsig.com/SSG-Warranty. A copy of this limited warranty can also be obtained by written request to Federal Signal Corporation, 2645 Federal Signal Drive, University Park, IL 60484, email to info@fedsig.com or call +1 708-534-3400.

This limited warranty is in lieu of all other warranties, express or implied, contractual or statutory, including, but not limited to the warranty of merchantability, warranty of fitness for a particular purpose and any warranty against failure of its essential purpose.
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1.0 Safety Messages

**WARNING**

It is important to follow all instructions shipped with this product. This device is to be installed by trained personnel who are thoroughly familiar with the country’s electric codes and will follow these guidelines as well as local codes and ordinances, including any state or local noise-control ordinances.

**Planning**

- If suitable warning equipment is not selected, the installation site for the system is not selected properly, or the system is not installed properly, it may not produce the intended optimum audible warning. Follow the Federal Emergency Management Agency (FEMA) recommendations.
- If the system is not activated in a timely manner when an emergency condition exists, it cannot provide the intended audible warning. It is imperative that knowledgeable people, who are provided with the necessary information, be available at all times to authorize activation.
- The sound output of the system is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan placement, post warnings, and restrict access to areas near loudspeakers. Review and comply with any local or state noise control ordinances as well as OSHA noise exposure regulations and guidelines.
- Activating the system may not result in people taking the desired actions if those to be warned are not properly trained about the meaning of warning sounds. Users should follow FEMA recommendations and instruct those to be warned of correct actions to be taken.

After installation, service, or maintenance, test the system to confirm that it is operating properly. Test the system regularly to confirm that it will be operational in an emergency.

1.1 Safety Messages to Installers

People’s lives depend on your safe installation of our products. It is important to follow all instructions shipped with this product. This device is to be installed by a trained electrician who is thoroughly familiar with the National Electrical Code and/or Canadian Electrical Code and will follow the NEC and/or CEC Guidelines as well as all local codes.

The selection of the mounting location for this system, its controls, and the routing of the wiring are to be accomplished under the direction of the Facilities Engineer and the Safety Engineer. Listed below are some other important safety instructions and precautions you should follow:

- Electrocution or severe personal injury can occur when performing various installation and service functions such as making electrical connections, drilling holes, or lifting equipment. Therefore, only experienced electricians should install this product in accordance with national, state, or province and any other electrical codes having jurisdiction. Perform all work under the direction of the installation or service crew safety foreman.
- Read and understand all instructions before installing, operating, or servicing this equipment.
Safety Messages

- All effective warning sounds may, in certain circumstances, cause permanent hearing loss. Take appropriate precautions, such as wearing hearing protection. The maximum sound level exposure limits specified in OSHA 29 CFR 1910 should not be exceeded.

- For optimum sound distribution, do not install the loudspeakers where objects would block any portion of the front of the system.

- Establish a procedure to routinely check the signal system for proper activation and operation.

- Any maintenance to the unit MUST be performed by a trained electrician in accordance with NEC Guidelines and local codes or a Federal Signal certified Service Provider.

- Never alter the unit in any manner.

- The nameplate should NOT be obscured, as it contains cautionary and/or other information of importance to maintenance personnel.

- After installation and completion of the initial system test, provide a copy of these instructions to all personnel responsible for the operation, periodic testing, and maintenance of the equipment.

- File these instructions in a safe place and refer to them when maintaining and/or reinstalling the device.

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death.

Installation and Service

- After installation or service, test the system to confirm that it is operating properly. Test the system regularly to confirm that it will be operational in an emergency.

- If future service and operating personnel do not have these instructions to refer to, the system may not provide the intended audible warning, and service personnel may be exposed to death, permanent hearing loss, or other bodily injuries. File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees. Also give a copy to anyone who is going to service or repair the system.

- To reduce the risk of electric shock, do not perform any servicing other than what is contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel. Always test the system before using after repairs have been made.

Ethernet Wiring

- Unless shielded or run in conduit, Ethernet wiring must be at least six feet from bare power wiring or lightning rods and associated wires, and at least six inches from other wire (for example, antenna wires, doorbell wires, wires from transformers to neon signs), steam or hot water pipes, and heating ducts.

- Do not place Ethernet wiring or connections in any conduit, outlet or junction box containing high voltage electrical wiring.
Symbol Definition

Indicates to reduce the risk of fire, replace the fuse as marked.

Pay careful attention to the notice located on the equipment.

*Read and understand the information contained in this manual before attempting to install or service the system.*
2.0 General Description

2.1 Introduction
This document is a description, installation, and user manual for the PAGASYS® Remote Controller and Remote Amplifier solution. Its intended audience are those assigned to use and maintain the system.

2.2 Overview
The initial PAGASYS GEN II system provided a fully functional Public Address/General Alarm (PA/GA) rack-mounted central command and control safety system that included A/B system redundancy. The latest release of this system included fully functional networking control redundancy using an Ethernet interface and Dante® network audio. The new PAGASYS Remote Controller and Amplifier take advantage of the new network solution to offer a low cost remote networked command and control chassis and a remote networked amplifier chassis.

3.0 Remote Controller (GENII-RC)
The new Remote Controller, model GENII-RC is a new controller addition to the PAGASYS GEN II product family. This new 2U form factor rack-mountable controller provides the user the capability of supporting PA/GA services remotely using an Ethernet interface without the need for a full PAGASYS GEN II cabinet.

Figure 1 GENII-RC Front Panel

The GENII-RC controller dynamically selects up to two simultaneous audio sources from eight analog and sixteen Dante® digital audio input channels. It provides audio, control, and monitoring for directly connected PAGASYS GEN II amplifier shelves and/or the new IP-connected GENII-RA700 amplifiers. Any six of the available digital and analog audio inputs can be simultaneously processed and routed via the controller’s Dante® audio over IP interface to remote Dante® enabled equipment such as Federal Signal GENII-RA700 amplifiers, standard PAGASYS GEN II controllers, or other GENII-RC Remote Controllers, to provide a flexible PAGA design platform that can be distributed over a wide geographic area.

The GENII-RC controller also possesses a two-audio-channel PAGASYS GENII amplifier audio bus and a two-audio-channel PAGASYS GENII A/B link interface, which allows the GENII-RC controller to act as a system controller and audio processor for standard PAGASYS GENII amplifiers, thus providing a cost reduced solution for less complex PAGASYS GENII PAGA systems.

The GENII-RC controller offers a wide range of onboard I/O interfaces. If the I/O needs exceed the onboard capabilities, the Remote Controller has a PAGASYS GEN II I/O port that allows the user to use existing PAGASYS GEN II I/O cards.
Included in the onboard I/O interfaces are the following:

- Front panel status LED that will flash to indicate a system fault
- Rear panel includes:
  - Eight digital inputs, programmable as dry contact or 24 Vdc input
  - Eight RJ45 access panel ports
  - Two RJ45 Dante®-enabled Ethernet ports
  - Fault relay contact
  - RJ45 A/B link interface with full-duplex RS485 and two audio channels
  - Two RJ45 Amplifier mux ports
  - Eight relay outputs
  - One I/O interface port
  - One SD card port
  - Two RS232 ports for debug or upgrade

Other features of the Remote Controller include:

- Six concurrent audio voices from sixteen available audio channels
- Microphone audio input using Dante® IP GAP input, no local microphone needed
- Eight hardware access panel inputs
- Same “soft” access panel as used by PAGASYS GEN II system
- Maximum of 128 zones
- Full Dante® network compliance, including compatibility with networked PAGASYS GEN II systems and Global Access Panels
- A/B and high integrity system redundancy
- 100-264 Vac source (48 Vdc to be released at a later date)
- 95% humidity non-condensing
- Designed for -20°C to +55°C
Remote Controller (GENII-RC)

Figure 2 GENII-RC Rear Panel

- AC power in
- 8 Digital outputs
- 8 Digital inputs
- SD card for file upload
- Fault relay output
- Expansion bus for I/O & beacon cards
- Serial console for CPU/DSP diagnostics & recovery
- Redundant network cable (Dante®)
- GENII amplifier or Aux audio out
- A/B controller link
- 8 Access panels

PAGASYS Remote Amplifier and Controller (GENII-RC and GENII-RA700)

Federal Signal www.fedsig.com
4.0 Remote Amplifier (GENII-RA700)

The new two-channel 700 W remote amplifier chassis, model GENII-RA700, is a new amplifier addition to the PAGASYS GEN II product family. This new 2U form factor rack-mountable amplifier supports PA/GA services in remote locations where there is a limited quantity of loudspeakers and beacons without the need of a full PAGASYS GEN II cabinet.

Figure 3 GENII-RA700 Front Panel

The remote amplifier, GENII-RA700, uses two analog audio inputs and a Dante® audio over IP interface over which the amplifier can receive up to four digital audio channels. The amplifier is also able to store and broadcast pre-recorded messages. The new remote amplifier uses these audio sources to broadcast through two 350 W channels that use thermally controlled gain management to ensure stable output, broadcasting at 100 or 70 $V_{\text{RMS}}$. The 70 $V_{\text{RMS}}$ model is GENII-RA700-70.

Multiple GENII-RA700 amplifiers can be connected in a two-channel amplifier standby bus configuration to provide dual-channel N+1 amplifier redundancy. The new amplifier can operate in standalone or networked mode.

In networked mode, the GENII-RA700 is controlled and monitored over an IP network connection by either a PAGASYS GEN II controller or a new GENII-RC Remote Controller. The controller can provide Dante® digital audio to the amplifier and will select which of the amplifier’s four digital audio inputs are dynamically routed to the two amplified channels. While in networked mode, the amplifier will report system status and faults back to its connected controller through the IP network.

When in standalone mode, the amplifier can route its analog audio inputs to the amplifier output channels and report faults via its local fault relay output. To support this mode, the amplifier can also be configured by a connected controller to broadcast local pre-recorded audio files to the amplifier output channels when the controller connection is lost. (The amplifier can fall back to a local standalone mode if it loses contact with the controller.)

The amplifier chassis has four configurable digital inputs, and two configurable signal relays in addition to a fault relay and a configurable power relay intended for switching Beacon circuits. The amplifier also provides a PAGASYS GEN II I/O port that allows the user to use the standard PAGASYS GEN II I/O cards. The amplifier’s four digital control inputs can be configured to initiate control for the beacon relay, support control for a broadcast of the local pre-recorded audio messages, or provide PTT function for its two analog audio inputs. Amplifier faults are reported via the local fault relay contacts.
The GENII-RA700 amplifier offers onboard I/O interfaces. If the I/O needs exceed the onboard capabilities, the remote amplifier has a PAGASYS GEN II I/O port that allows the user to use existing PAGASYS GEN II I/O cards.

Included in the onboard I/O interfaces are the following:

- Front panel status LED that will flash to indicate a system fault
- Two analog audio inputs with pass-through connections to daisy-chain multiple amplifier chassis
- Two 350 W thermally controlled audio outputs
- Four software-configurable digital inputs for connection to external voltage-free contacts
- Two RJ45 Dante®-enabled Ethernet ports
- Fault relay contact
- Standby bus interface
- Two volume knobs
- One of each calibrate and factory reset buttons
- Two relay outputs
- One beacon power relay
- One I/O interface port

**Figure 4 GENII-RA700 Rear Panel AC Chassis**
5.0 Remote Networking Overview

With the addition of the network controller and amplifiers, the Federal Signal PAGASYS system adds new options for control and amplified alarming, using a lower-cost option. The Remote Amplifier can be deployed with a connection to the PAGASYS GEN II controllers, connected to one of the new Remote Controllers, or in a standalone mode.

Figure 5 Remote Networking Overview
5.1 Examples of Amplifier Configurations

5.1.1 Remote Amplifier in Standalone Mode

The amplifier in standalone mode is the default deployment option. When deployed in default standalone mode, where there is no pre-provisioning by a PAGASYS controller, the amplifier will automatically route the audio inputs to the audio output (speaker) ports. Audio input 1 is routed to audio output 1, and audio input 2 is routed to audio output 2. Volume control is possible using rear-panel rotary controls. In this configuration, no other I/O is available other than audio in/out, and no recorded audio files are available. Simple faults are output to the fault relay on the rear panel of the amplifier.

Table 1 Remote Amplifier in Standalone Mode

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fault Indication</td>
<td>Fault Relay operates</td>
</tr>
<tr>
<td></td>
<td>• Over-temperature</td>
</tr>
<tr>
<td></td>
<td>• Under-voltage</td>
</tr>
<tr>
<td></td>
<td>• Earth fault</td>
</tr>
<tr>
<td></td>
<td>• Fan fail</td>
</tr>
<tr>
<td>Control</td>
<td>None, amplifier is always on</td>
</tr>
<tr>
<td>I/O Options</td>
<td>None</td>
</tr>
<tr>
<td>Impedance Monitoring</td>
<td>None</td>
</tr>
<tr>
<td>Inputs</td>
<td>Two Analog inputs on rear panel</td>
</tr>
<tr>
<td>Volume</td>
<td>Rear panel rotary controls</td>
</tr>
</tbody>
</table>
5.1.2 Remote Amplifier in Pre-Configured Standalone Mode

The amplifier in pre-configured standalone mode is where the amplifier is configured by connecting to a laptop or PC, but not permanently connected to the PC or network. In this configuration, the same attributes available in standalone mode are available, but the amplifier also supports impedance monitoring, configured using the web browser, and includes an impedance fault. Amplifier volume can be configured through a web browser.

**Figure 7 Remote Amplifier in Pre-Configured Standalone Mode**

![Diagram of Remote Amplifier in Pre-Configured Standalone Mode]

**Table 2 Remote Amplifier in Pre-Configured Standalone Mode**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fault Indication</td>
<td>Fault Relay operates</td>
</tr>
<tr>
<td></td>
<td>• Over-temperature</td>
</tr>
<tr>
<td></td>
<td>• Under-voltage</td>
</tr>
<tr>
<td></td>
<td>• Earth fault</td>
</tr>
<tr>
<td></td>
<td>• Fan fail</td>
</tr>
<tr>
<td></td>
<td>• Impedance fault</td>
</tr>
<tr>
<td>Control</td>
<td>None, amplifier is always on or triggered by built-in inputs</td>
</tr>
<tr>
<td>I/O Options</td>
<td>None or triggered by built-in inputs</td>
</tr>
<tr>
<td>Impedance Monitoring</td>
<td>Configured via a web browser</td>
</tr>
<tr>
<td>Inputs</td>
<td>Two Analog inputs on rear panel</td>
</tr>
<tr>
<td>Volume</td>
<td>Rear-panel rotary controls or configured via a web browser</td>
</tr>
</tbody>
</table>
**Remote Networking Overview**

**5.1.3 Remote Amplifier in IP Controlled Mode**

The amplifier in IP controlled mode is where the amplifier is configured by connecting to a laptop or a PC and is permanently connected to the network for configuration and monitoring.

In this configuration, the PC supports:

- Fault/status collection
- Control audio routing
- Provides Dante® digital audio to the amplifier
- Performs simple I/O configuration
- Provides a simple ETP-like control panel interface

**Figure 8 Remote Amplifier in IP Controlled Mode**

![Image](image_url)  
*Figure 8 Remote Amplifier in IP Controlled Mode*

**Table 3 Remote Amplifier in IP Controlled Mode**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fault Indication</td>
<td>Fault Relay operates</td>
</tr>
<tr>
<td></td>
<td>• Over-temperature</td>
</tr>
<tr>
<td></td>
<td>• Under-voltage</td>
</tr>
<tr>
<td></td>
<td>• Earth fault</td>
</tr>
<tr>
<td></td>
<td>• Fan fail</td>
</tr>
<tr>
<td></td>
<td>• Impedance fault</td>
</tr>
<tr>
<td>Control</td>
<td>None, amplifier is always on or triggered by built-in inputs</td>
</tr>
<tr>
<td>I/O Options</td>
<td>None or triggered by built-in inputs</td>
</tr>
<tr>
<td>Impedance Monitoring</td>
<td>Configured via a web browser</td>
</tr>
<tr>
<td>Inputs</td>
<td>Two Analog inputs on rear panel</td>
</tr>
<tr>
<td></td>
<td>Four Dante® inputs</td>
</tr>
<tr>
<td>Volume</td>
<td>Rear-panel rotary controls or configured via a web browser</td>
</tr>
</tbody>
</table>
5.1.4 Remote Amplifier in PAGASYS Controlled Mode

The amplifier in PAGASYS controlled mode is where the amplifier is part of a PAGASYS system, but is physically remote from the main control rack.

Figure 9 Remote Amplifier in PAGASYS Controlled Mode
5.2 Controller and Amplifier Configuration Options

5.2.1 PAGASYS GEN II Controller Chassis (single or duplicated)

The following diagram shows using the PAGASYS GEN II Controller Chassis (single or duplicated).

Figure 10 PAGASYS GEN II Controller Chassis (single or duplicated)

With this configuration, the controller will offer four simultaneous voices, either for a single controller/amplifier configuration or for a duplicated system. (The duplicated system uses PAGASYS A/B link).

5.2.2 PAGASYS GEN II Controller Chassis (redundant Controller, shared Amplifiers)

The following diagram shows using PAGASYS GEN II Controller Chassis (redundant Controller, shared Amplifiers).

Figure 11 PAGASYS GEN II Controller Chassis (redundant Controller, shared Amplifiers)

With this configuration, there are two Simultaneous Voices: two from Master Controller or two from Standby Controller.
5.2.3 PAGASYS GEN II Controller Chassis (standalone Controller, Amplifiers)
The following diagram shows using PAGASYS GEN II Controller Chassis (standalone Controller, Amplifiers).

**Figure 12 PAGASYS GEN II Controller Chassis (standalone Controller, Amplifiers)**

```
<table>
<thead>
<tr>
<th>GENII-RC Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENII-RA700</td>
</tr>
<tr>
<td>GENII-RA700</td>
</tr>
</tbody>
</table>
```

With this configuration, there are four Simultaneous Voices.

5.2.4 GENII-RC Controller (duplicated)
The following diagram shows using GENII-RC Controller. (The duplicated system using PAGASYS A/B link.)

**Figure 13 GENII-RC Controller (duplicated)**

```
<table>
<thead>
<tr>
<th>GENII-RC Controller</th>
<th>GENII-RC Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENII-RA700</td>
<td>GENII-RA700</td>
</tr>
<tr>
<td>GENII-RA700</td>
<td>GENII-RA700</td>
</tr>
</tbody>
</table>
```

With this configuration, there are two Simultaneous Voices.

5.2.5 GENII-RC Controller (redundant Controller, shared Amplifiers)
The following diagram shows using GENII-RC Controller (redundant Controller, shared Amplifiers).

**Figure 14 GENII-RC Controller (redundant Controller, shared Amplifiers)**

```
<table>
<thead>
<tr>
<th>GENII-RC Controller</th>
<th>GENII-RC Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENII-RA700</td>
<td>GENII-RA700</td>
</tr>
<tr>
<td>GENII-RA700</td>
<td>GENII-RA700</td>
</tr>
</tbody>
</table>
```

With this configuration, there are two Simultaneous Voices.
5.2.6 GENII-RC Controller with Full PAGASYS Amplifier Chassis (single or duplicated)
The following diagram shows using GENII-RC Controller with Full PAGASYS Amplifier Chassis (single or duplicated).

Figure 15 GENII-RC Controller with Full PAGASYS Amplifier Chassis (single or duplicated)

With this configuration, there are two Simultaneous Voices.

5.2.7 GENII-RC Controller with Full PAGASYS Amplifier Chassis (redundant Controllers, shared Amplifiers)
The following diagram shows using GENII-RC Controller with Full PAGASYS Amplifier Chassis (redundant Controllers, shared Amplifiers.

Figure 16 GENII-RC Controller with Full PAGASYS Amplifier Chassis (redundant Controllers, shared Amplifiers

With this configuration, there are two Simultaneous Voices (duplicated uses PAGASYS A/B link).

5.3 Controller and Amplifier Configuration Options with ISMT
Any configuration of PAGASYS GEN II or GENII-RC controller, when connected to ISMT enabled PAGASYS GEN II amplifiers, can support ISMT speakers and applications. ISMT functionality is not available for GENII-RA700 amplifiers.

Getting Service
If you are experiencing any difficulties, contact Federal Signal Technical Support at 800-524-3021 or through e-mail at techsupport@fedsig.com. For instruction manuals and information on related products, visit http://www.fedsig.com/